Before the Federal Communications Commission Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of Part 101 of the Commission's Rules	)	WT Docket No. 10-153
to Facilitate the Use of Microwave for Wireless	)	
Backhaul and Other Uses and to Provide Additional	)	
Flexibility to Broadcast Auxiliary Service and	)	
Operational Fixed Microwave Licensees	)	
	)	

COMMENTS OF EXALT COMMUNICATIONS

Exalt Communications Inc. is a leading innovator in fixed service microwave backhaul based in the Silicon Valley. Exalt offers a full range of cost-effective and flexible microwave radio systems to government organizations, enterprises and service providers worldwide for next generation TDM and IP networks.

Below are Exalt's comments regarding the latest proposals before the Commission.

Availability

Exalt believes that the suggestion to regulate availability of microwave links to 99.999% is in conflict with the National Broadband Plan because it would create a significant financial burden and impose a restrictive environment for deployment of fixed wireless services for broadband communications infrastructure. Mandating 99.999% availability has the following disadvantages, for example:

1. There are currently no industry standard, universally-accepted formulas and methods for determining availability, making the definition of 99.999% availability subject to interpretation and impossible to enforce. Multiple formulas exist for estimating availability, and the quality and accuracy of the terrain and clutter models used in the availability estimation can have a dramatic impact on the results. We do not see how all interested parties could come to agreement on the method for establishing the criteria. This would also need to be an ever-adapting standard as new methods and new databases become available and as clutter data changes over time. Lastly, the availability calculation may or may not take into account payload capacity, resulting in potentially different results.

2. Availability calculations are predictive and not necessarily indicative of the actual results. Given the nature and intrinsic inaccuracies of these calculations, it is questionable that the Commission would want to regulate a prediction.

3. Mandating 99.999% availability would make many fixed wireless links uneconomical and installation impractical. This is especially in rural areas or very long links where the cost of delivering this level of availability would yield fixed wireless services uneconomical. For example, redesigning a 99.995% link using an 8' dish to 99.999%

availability could require a 10' dish at significant material and installation cost as well as increased tower costs assuming the dish could even be mounted. These higher costs would be passed on to consumers making broadband access even less accessible to the public.

4. Mandating 99.999% availability would make certain frequency bands completely unusable in high rain regions, such as Florida, leaving high capacity fixed wireless services unavailable and limiting infrastructure options to serve the public need.

5. Engineering all links to 99.999% availability may increase interference because the path engineering may result in the unnecessary need to increase transmit output power levels, even though it may not be needed for the specific application.

6. The increased costs of deploying links with 99.999% availability also means that spectrum would only be available to large operators or corporations that can afford to deploy such costly infrastructure, limiting both access to competition and choices available to consumers. Furthermore, their choice of microwave equipment would also create an anti-competitive environment because only incumbent or preferred vendors would benefit from such deployments and would give them little or no motivation to innovate in this area.

7. Packet switched networks have different availability requirements because they are not connection oriented, like TDM. A packet that gets lost is retransmitted because higher level protocols provide inherent resiliency and a data network typically provides multiple paths for the packet to travel. Also, the bursty nature of packet switching means the capacity of the link is only used when needed. All these reasons make the requirement for 99.999% availability even less sensible because it restricts the application of fixed wireless for Internet and data network connectivity. As shown below, the use of Adaptive Modulation *actually increases* the availability and efficiency of a link, rather than decreasing it and it is more suitable to the hybrid TDM/IP and all-IP networks of today.

Adaptive Modulation

Adaptive Modulation is innovative functionality that actually increases both spectrum efficiency and link availability. Adaptive Modulation can be implemented within the current Part 101 efficiency rules and provides numerous benefits, including:

1. Increasing overall availability of the link. A link that is down due to fading continues to transmit but is unable to carry user traffic. The spectral efficiency is zero. During the outage, there is a no violation of Rule 101.141 (a)(3) because the rule specifies equipment performance and not path outage due to fading which is an act of God . With adaptive modulation however, the link can stay up *despite the fade* providing increased availability while adhering to the spectral efficiency regulations.

2. Improving system gain without increasing interference. Opponents of adaptive modulation state that it would cause interference due to increased output power at lower modulations or that operators could select smaller and lower performance antennas. Furthermore, they state that operators could choose to use higher channel bandwidth and

simpler modulation to improve system gain and thus violate section 101.141 (a)(3). Exalt contends that this argument has nothing to do with adaptive modulation and operators can actually violate the rules just the same *without it.* After the license is awarded, operators have a legal responsibility to adhere to the parameters of that license even if they have the capability to operate at different channel size, modulation or output power. The same should apply to the case of adaptive modulation. Adaptive modulation should not be viewed by the Commission as a proposal to violate the rules as Comsearch suggests, but rather as a way to modernize the rules to enhance fixed wireless services without compromising the spirit of existing Part 101 rules.

Engineering a path with adaptive modulation actually helps *reduce* interference because a link can be designed with lower output power for a specific link distance, capacity and availability *while meeting* the high performance antenna requirements specified in the existing regulations. If there is concern about this, Exalt suggests that adaptive modulation coordination should be mandated to set output power no greater than the power coordinated at the target (highest) modulation.

3. Lowering costs and increasing range for fixed wireless applications. While adaptive modulation increases spectrum efficiency and link up-time, it also prevents links from having to be "over-engineered" for the application, especially IP/Ethernet services. By allowing the market to define the availability and using adaptive modulation to maintain link connectivity during periods of fading, the following benefits can be achieved:

    a. Smaller antennas can be used resulting in lower installation costs (CAPEX) and reduced recurring tower rental costs (OPEX). These savings can be passed on to end users while increasing the levels of service and maintaining adherence to Part 101 rules. Note that we refer to "smaller antennas" as those allowed for the specific bands under the current rules, including required high performance antennas.

    b. Longer distances can be covered in any band, extending the usefulness of spectrum outside the traditional limits imposed by TDM availability requirements. This is especially important in rural areas, where longer distances can be covered while meeting the payload capacity and user service level requirements. Extending range also means lower infrastructure and licensing costs because it results in a lower number of repeating links required for long haul. It also saves spectrum because additional channels don't need to be licensed to extend the link further. Furthermore, it is now technically feasible to achieve longer distances using the exact same coordinated EIRP and interference envelopes defined in the rules today, making it more economical for end-users willing to accept the performance levels of new Internet applications.

Auxiliary Stations

Exalt supports eliminating antenna standards and minimum path requirements for auxiliary stations because they restrict technological innovation that can make use of otherwise wasted spectrum around the primary station, which is already a scarce natural resource.

By allowing the use of auxiliary stations the already-coordinated EIRP energy around a primary station can used by the licensee for multiple secondary links on the same coordinated frequency *without creating interference* to other licensees or requiring additional spectrum. Allowing would also create a more competitive environment because more spectrum would be available for other applications and would give financial incentive to operators to reuse resources and expand their services *without* consuming spectrum unnecessarily.

Smaller antenna sizes would reduce costs and make it practical to install multiple secondary stations so that spectrum could be reused. Smaller secondary antennas themselves would not increase interference because they still need to be coordinated, per the current rules. The coordinating agencies are already set up to work with primary license holders to determine if interference exists and what to do about it.

Respectfully submitted,

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